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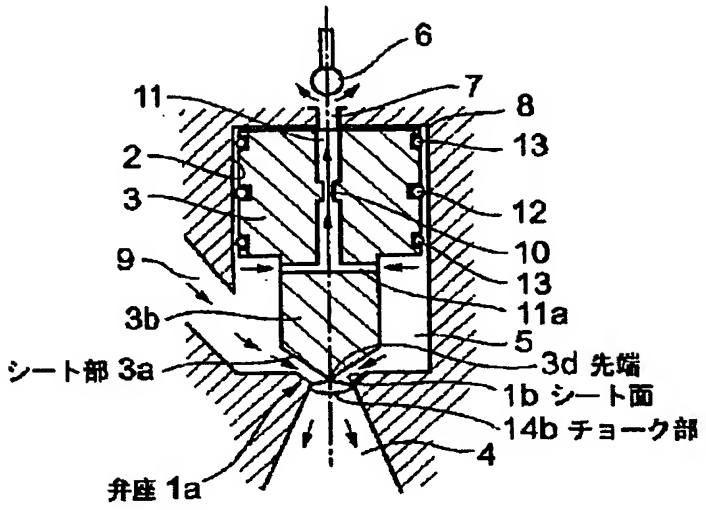
TITLE : FLOATING TYPE POPPET VALVE DEVICE



ABSTRACT : PROBLEM TO BE SOLVED: To prevent the generation of a harmful impact wave in a nozzle situated downstream as a low pressure region is insured in the vicinity of the tip of a poppet valve and to provide a poppet valve device which is to be increased in a thrust factor, having high efficiency.

SOLUTION: By the pressure difference between two chambers fronting on the upper and surface and the under surface of a poppet valve, the tip seat part of the poppet valve is removably mounted on a valve seat to open and close a gas passage. In a so formed poppet valve device, the poppet valve has the tip seat part the end part of which is formed into a reduced conical shape, and its seat surface is formed in a conical surface along the shape of the tip seat part. The passage area of a choke part formed between the conical surface and a gas passage situated downstream is decreased to a value lower than the area of a passage between the tip seat part and the seat surface during a maximum lift of the poppet valve. Furthermore, the tip seat part of the poppet valve is formed such that a tip position, when the poppet valve is lifted is positioned in a level above that of the choke part.

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : MITSUBISHI HEAVY IND LTD

(72)Inventor : FUJITA TOSHIHARU

(54) FLOATING TYPE POPPET VALVE DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To prevent the generation of a harmful impact wave in a nozzle situated downstream as a low pressure region is insured in the vicinity of the tip of a poppet valve and to provide a poppet valve device which is to be increased in a thrust factor, having high efficiency.

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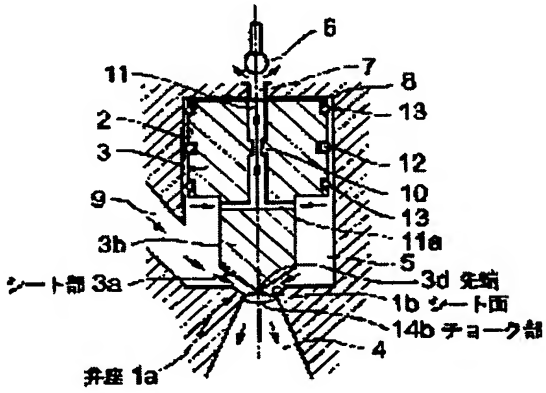

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* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] By the differential pressure of two ** which the vertical side of the poppet valve fitting of the both-way sliding of in a cylinder was made free faces In the floating type poppet valve equipment constituted so that the tip sheet section of this poppet valve might be detached and attached to a valve seat and a gas passageway might be opened and closed said poppet valve Said tip sheet section is in the cone configuration which the edge reduced. Said valve seat While forming the sheet surface in the cone-like side in alignment with the configuration of said tip sheet section Floating type poppet valve equipment characterized by constituting the path area of the choke section formed between this cone-like side and a down-stream gas passageway so that it may become smaller than the path area between said tip sheet section at the time of the maximum lift of said poppet valve, and said sheet surface.
[Claim 2] The tip sheet section of said poppet valve is floating type poppet valve equipment according to claim 1 with which the tip location is characterized by being constituted so that it may be located more nearly up than the choke section formed in the lower limit of the sheet surface of said valve seat when this poppet valve carries out a lift.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to amelioration of the sheet section of a poppet valve and a valve seat especially about the floating type poppet valve equipment used for the thrust control in the thruster equipment of a rocket engine etc.
[0002]
[Description of the Prior Art] In the rocket engine which uses a solid propellant, the combustion gas flow rate which passes the nozzle throat section is controlled by changing the throat area in the nozzle throat section which passes to a combustion chamber. Invention of JP,6-58090,B is offered as a technique which controls the throat area of this nozzle throat section. In this invention, said combustion chamber chamber is equipped with the nozzle holder which has the nozzle skirt board which fixes a pintle to the back end of a combustion chamber chamber, and forms the nozzle throat section by this pintle possible [axial directional movement], this nozzle holder is moved to shaft orientations, and it constitutes so that nozzle throat area may be changed continuously. A migration part becomes large-sized in order to move the nozzle holder which has a nozzle skirt board to shaft orientations in this invention.
[0003] Then, the floating type poppet valve equipment to which the throat area which does not have the above troubles is changed and which is shown in drawing 5 - drawing 6 as a means is proposed. Drawing 5 - drawing 6 show the outline configuration of this floating type poppet valve equipment, and drawing 5 is drawing 6 at the valve-opening time at the time of the clausilium of a poppet valve.
[0004] In drawing 5 - drawing 6 , it is the cylinder by which 1 was formed in housing and 2 was formed in this housing 1, and fitting of the both-way sliding of the poppet valve 03 of a floating type is made free into this cylinder 2. This poppet valve 03 is constituted by heat-resistant metals, such as a tungsten.
[0005] The combustion gas generated in the combustion chamber (un-illustrating) at the time of actuation of the floating type poppet valve equipment shown in drawing 5 - drawing 6 is introduced into the inlet-port room 5 from a feed hopper 9. As shown in drawing 5 , on the other hand at the time of close [of a poppet valve 03], with a pilot valve control unit (un-illustrating) A pilot valve 6 is closed and the pressure of the working fluid in the pressure room 8 serves as high pressure. The downward force by the pressure of this working fluid becomes larger than the upward force by the combustion gas pressure in the inlet-port room 5, and sheet section 03a of a poppet valve 03 is forced on valve seat 1a of housing 1, and is intercepting the outflow for the nozzle 4 of combustion gas.
[0006] If a pilot valve 6 is opened by said pilot valve control unit as shown in drawing 6 , the working fluid in the pressure room 8 is discharged, the upward force by the combustion gas in the inlet-port room 5 becomes larger than the downward force by said working fluid, it will upper-**, said sheet section 03a will separate from valve seat 1a, and a poppet 03 will open a poppet valve. A thrust is generated, when combustion gas flows from the inlet-port room 5 to a nozzle 4 and blows off outside by valve opening of this poppet valve 03, as shown in the arrow head of drawing 6 .
[0007] On the other hand, a part of combustion gas in the inlet-port room 5 goes into a through-hole

011, and after it is extracted by the poppet orifice 010 and flows into the pressure room 8 side, it is discharged outside through a pilot valve 6. By changing whenever [drawing / of this poppet orifice 010], i.e., path area, the valve-opening rate and clausilium rate of a poppet 03 are adjusted.
[0008]
[Problem(s) to be Solved by the Invention] It has the following troubles, if it is in the floating type poppet valve equipment concerning the conventional technique shown in drawing 5 - drawing 6 . namely, -- since the whole serves as an elevated temperature during actuation, this poppet valve 03 is impossible for use of an O ring -- becoming -- the clearance between the sliding sections of the peripheral face of a poppet valve 03, and a cylinder 2 -- large -- not forming -- it does not obtain, but combustion gas flows this clearance, and generating of the heat stick of a poppet valve 03 is seen in many cases.
[0009] Moreover, since said through-hole 011 cannot be found on axial center 03c of a poppet valve 03, the flow of the combustion gas of the circumference of lower 03b of this poppet valve 03 does not turn into flow symmetrical with axial center 03c, but the fluid force T of the direction of a right angle acts on a poppet 03 at this axial center 03c, **** occurs in this poppet valve 03, and, thereby, the stick of a poppet valve 03 is caused to it by this fluid force T. Furthermore, since the tungsten material which constitutes said poppet valve 03 has specific gravity as large as about three 19 g/cm, the responsibility of this poppet valve 03 becomes [the weight of a poppet valve 03] large low.
[0010] In order to solve this trouble, this applicant proposed invention of Japanese Patent Application No. No. 85736 [11 to].
[0011] This invention is shown in drawing 3 - drawing 4 as an example of a comparison. Drawing 3 - drawing 4 show the outline configuration of the floating type poppet valve equipment for rocket and, as for drawing 4 , drawing 3 shows the time of valve opening at the time of the clausilium of a poppet valve.
[0012] In drawing 3 - drawing 4 , it is the cylinder by which 1 was formed in housing and 2 was formed in this housing 1, and fitting of the both-way sliding of the poppet valve 3 of a floating type is made free into this cylinder 2. 8 is the pressure room as for which partition formation was carried out by the top face and cylinder 2 of this poppet valve 3, and the working-fluid feed hopper 7 opened and closed by the pilot valve 6 is carrying out opening to this pressure room 8. This pilot valve 6 controls the pressure of said pressure room 8 by carrying out closing motion actuation with an actuator (un-illustrating).
[0013] 5 is the inlet-port room of the combustion gas formed in said housing 1, and the periphery of lower 3b of said poppet valve 3 has faced it. 9 is the feed hopper of the combustion gas to this inlet-port room 5, and is connected to the combustion chamber (un-illustrating). 4 is a nozzle for making combustion gas blow off. Conic sheet section 3a is formed at the tip of the lower limit section 3b, and said poppet valve 3 opens and closes between said inlet-port rooms 5 and nozzles 4 by detaching and attaching with valve seat 1a prepared in housing 1.
[0014] Said poppet valve 3 consists of heat-resistant composites, such as ceramic fiber with small thermal conductivity. 11 is the through-hole punched inside this poppet valve 3. Opening of this through-hole 11 is carried out to the field facing, the top face 8, i.e., said pressure room, of a poppet valve 3, and it is caudad prolonged along with axial center 3c of a poppet valve 3 from this top face, branches in the direction of a right angle in lower 3b of this poppet valve 3 (11a), and is carrying out opening to said inlet-port room 5. And in the middle of this through-hole 11, the poppet orifice 10 to which the path was extracted is formed. O ring 12 which consists of heat-resistant oilproof rubber material is fitted in the periphery sliding section of said poppet valve 3, and the piston rings 13 and 13 which consist of a good metal of thermal resistance and sliding nature of this O ring 12 up and down are fitted in it.
[0015] The combustion gas generated in the combustion chamber (un-illustrating) at the time of actuation of this floating type poppet valve equipment is introduced into the inlet-port room 5 from a feed hopper 9. As shown in drawing 3 , on the other hand at the time of close [of a poppet valve 3], with a pilot valve control unit (un-illustrating) A pilot valve 6 is closed and the pressure of the working fluid in the pressure room 8 serves as high pressure. The downward force by the pressure of this

working fluid becomes larger than the upward force by the combustion gas pressure in the inlet-port room 5, and sheet section 3a of a poppet valve 3 is forced on valve seat 1a of housing 1, and is intercepting the outflow for the nozzle 4 of combustion gas.
[0016] If a pilot valve 6 is opened by said pilot valve control unit as shown in drawing 4 , the working fluid in the pressure room 8 is discharged, the upward force by the combustion gas in the inlet-port room 5 becomes larger than the downward force by said working fluid, it will upper-**, said sheet section 3a will separate from valve seat 1a, and a poppet valve 3 will open a poppet valve. A thrust is generated, when combustion gas flows from the inlet-port room 5 to a nozzle 4 and blows off outside by valve opening of this poppet valve 3, as shown in the arrow head of drawing 4 .
[0017] On the other hand, a part of combustion gas in the inlet-port room 5 goes into a through-hole 11, and after it is extracted by the poppet orifice 10 and flows into the pressure room 8 side, it is discharged outside through a pilot valve 6. By changing whenever [drawing / of this poppet orifice 10], i.e., path area, the valve-opening rate and clausilium rate of a poppet valve 3 are adjusted.
[0018] In this example of a comparison, although lower 3b which touches combustion gas directly is heated and a poppet valve 3 serves as an elevated temperature since thermal conductivity consists of heat-resistant composites of ceramic fiber small enough compared with the conventional tungsten material, the amount of heat conduction to the sliding section with a cylinder 2 decreases, and the temperature rise of this sliding section is controlled. Though natural [cause / this / burning and] even if this uses O ring 12 which becomes this sliding section from a heatproof and oilproof rubber, even if it uses the metal piston rings 13 and 13, it has thermal resistance high enough. Therefore, the seal nature of the periphery sliding section of a poppet valve 3 improves sharply compared with the case of the seal of a metal side. Thereby, leakage of the combustion gas from the periphery sliding section is avoided, and generating of the heat stick of the poppet valve by this leakage is avoided.
[0019] Moreover, since this poppet valve 3 has formed the through-hole 11 with poppet orifice 10 in the symmetry at the axial center 3c, the fluid force T by the combustion gas which acts on this poppet valve 3 balances, generating of imbalance force like the conventional technique is avoided, generating to which the poppet valve 3 by this imbalance force becomes complicated, and generating of poor actuation of a poppet valve 3 caused by this are prevented, and actuation of a poppet valve 3 is attained smoothly. Furthermore, it becomes good [this poppet valve 3], since specific gravity is small compared with the tungsten material (specific gravity = about three 19 g/cm) of the conventional technique the responsibility [become lightweight and] at the time of closing motion.
[0020] However, in the example of a comparison shown in drawing 3 - drawing 4 , it has the following technical problems which should be solved. That is, in this example of a comparison, the part from which the choke (narrowing down) of the working fluid is carried out in choke section 14a formed in the clearance between valve seat 1a and sheet section 3a at the time of valve opening shown in drawing 4 , and the flow passage area of the flow of this working fluid serves as min is near the sheet section of valve seat 1a. This configuration is a configuration required in order for the rate of flow of the lower stream of a river of said choke section 14a to turn into a supersonic speed and to generate the closedown force by the differential pressure which needs the pressure of a working fluid in case [of the pressure of the upstream inlet-port room 5] about 1/is set to 2, a low voltage field is generated at the tip of poppet valve lower 3b and this poppet valve 3 closes at the time of the flow in this supersonic condition.
[0021] However, since 3d of tips of this poppet valve 3 is in the downstream of said choke section 14a when said poppet valve 3 is open as shown in drawing 4 if it is in this example of a comparison, as for the working fluid accelerated to the supersonic condition as mentioned above, an impulse wave is generated from 3d of tips of a poppet valve 3. If there is generating of this impulse wave, turbulence will arise with the flow in the nozzle 4 of the downstream, and a thrust will decline.
[0022] Therefore, even if a thrust coefficient becomes small and consumes the propellant of the same daily dose since the point of a poppet valve 3 and the configuration of valve seat 1a are constituted as mentioned above if it is in the poppet valve equipment in this example of a comparison, the trouble that this is not used effectively as a thrust is held. In addition, although the poppet valve equipment which formed the sheet surface of the tip sheet section of a poppet valve and a valve seat in the cone

configuration which the edge reduced in JP,1-179100,U is offered, in this conventional technique, the relation between the choke section of a valve seat and a poppet valve is not indicated.
[0023] Securing a low voltage field near the poppet valve tip in view of the technical problem of this conventional technique or the example of a comparison, it avoids generating of an impulse wave harmful in a down-stream nozzle, and this invention aims at a thrust coefficient offering efficient large poppet valve equipment.
[0024]
[Means for Solving the Problem] In order that this invention may solve this technical problem, by the differential pressure of two ** which the vertical side of the poppet valve fitting of the both-way sliding of in a cylinder was made free as invention according to claim 1 faces It is floating type poppet valve equipment constituted so that the tip sheet section of this poppet valve might be detached and attached to a valve seat and a gas passageway might be opened and closed. Said poppet valve Said tip sheet section is formed in the cone configuration which the edge reduced. Said valve seat While forming the sheet surface in the cone-like side in alignment with the configuration of said tip sheet section The floating type poppet valve equipment characterized by constituting the path area of the choke section formed between this cone-like side and a down-stream gas passageway so that it may become smaller than the path area between said tip sheet section at the time of the maximum lift of said poppet valve and said sheet surface be proposed.
[0025] Invention according to claim 2 is characterized by constituting the tip sheet section of said valve so that the tip location may be located more nearly up than the choke section formed in the lower limit of the sheet surface of said valve seat, when this poppet valve carries out a lift in claim 1.
[0026] According to this invention, if a pilot valve is opened, the working fluid of the pressure interior of a room with the poppet valve bottom will be discharged, the upward force by inlet-port indoor combustion gas will become larger than the downward force by said working fluid, a poppet valve will be upper-**(ed), the tip sheet section will separate from the conical surface of a valve seat, and this poppet valve will open. By valve opening of this poppet valve, combustion gas flows between the poppet valve tip sheet section and the conical surfaces of a valve seat, and through said choke section, down-stream gas passageway, i.e., nozzle, blows off from an inlet-port room outside, and, thereby, generates a thrust.
[0027] Since it forms in the cone-like side which met the configuration of the tip sheet section of a poppet valve in the sheet surface of a valve seat at the time of valve opening of this poppet valve, while the flow passage area of this passage section is kept constant The path area of the choke section formed between the cone-like side of said valve seat, and a down-stream gas passageway Since it forms smaller than the path area between the tip sheet section of said poppet valve at the time of the maximum lift of said poppet valve, and the sheet surface of said valve seat, the flow of a working fluid By being extracted in this choke section more slightly than said passage section, it becomes acoustic velocity 1, i.e., Mach, and the flow of said sheet section side passage section is maintained at a high speed in subsonic.
[0028] It is prevented that low voltage with a low voltage field [/ near the point of said poppet valve] equivalent to the conventional thing is held according to this operation, and an impulse wave occurs like said conventional technique and example of a comparison as mentioned above since the flow of the sheet section side passage section is subsonic. Furthermore, in addition to said configuration, it is prevented by the point of this poppet valve like claim 2 by constituting a tip location when this poppet valve of the tip sheet section of said poppet valve carries out a lift so that it may be located more nearly up than said choke section that turbulence of the flow of a working fluid occurs in a down-stream gas passageway.
[0029] Therefore, according to this invention, securing a low voltage field near the poppet valve point, generating of a harmful impulse wave is prevented in a down-stream gas passageway, and poppet valve equipment with it is obtained. [a large thrust coefficient and] [efficient]
[0030]
[Embodiment of the Invention] Hereafter, with reference to a drawing, the suitable operation gestalt of

this invention is explained in detail in instantiation. However, the dimension of the component part indicated by this operation gestalt, the quality of the material, a configuration, its relative arrangement, etc. are not the meaning that limits the range of this invention to it but only the mere examples of explanation, as long as there is no specific publication especially.
[0031] Drawing 1 - drawing 2 show the outline configuration of the floating type poppet valve equipment for rocket engines concerning the operation gestalt of this invention, and, as for drawing 1 , drawing 2 shows the time of valve opening at the time of the clausilium of a poppet valve.
[0032] In drawing 1 - drawing 2 , it is the cylinder by which 1 was formed in housing and 2 was formed in this housing 1, and fitting of the both-way sliding of the poppet valve 3 of a floating type is made free into this cylinder 2. 8 is the pressure room as for which partition formation was carried out by the top face and cylinder 2 of this poppet valve 3, and the working-fluid feed hopper 7 opened and closed by the pilot valve 6 is carrying out opening to this pressure room 8. This pilot valve 6 controls the pressure of said pressure room 8 by carrying out closing motion actuation with an actuator (un-illustrating).
[0033] 5 is the inlet-port room of the combustion gas formed in said housing 1, and the periphery of lower 3b of said poppet valve 3 has faced it. 9 is the feed hopper of the combustion gas to this inlet-port room 5, and is connected to the combustion chamber (un-illustrating). 4 is a nozzle for making combustion gas blow off. Conic sheet section 3a is formed in the point of the lower 3b, and said poppet valve 3 opens and closes between said inlet-port rooms 5 and nozzles 4 by detaching and attaching with sheet surface 1b of valve seat 1a constituted so that it might be prepared in housing 1 and might mention later.
[0034] Said poppet valve 3 consists of heat-resistant composites, such as ceramic fiber with small thermal conductivity. 11 is the through-hole punched inside this poppet valve 3. Opening of this through-hole 11 is carried out to the field facing, the top face 8, i.e., said pressure room, of a poppet valve 3, and it is caudad prolonged along with axial center 3c of a poppet valve 3 from this top face, branches in the direction of a right angle in lower 3b of this poppet valve 3 (11a), and is carrying out opening to said inlet-port room 5. And in the middle of this through-hole 11, the poppet orifice 10 to which the path was extracted is formed.
[0035] The piston rings 13 and 13 with which O ring 12 which consists of heat-resistant oilproof rubber material becomes a list from the good metal of thermal resistance and sliding nature of this O ring 12 up and down are fitted in the periphery sliding section of said poppet valve 3.
[0036] The above configuration is the same as that of the example of a comparison shown in drawing 3 - drawing 4 . In this invention, the structure of the sheet part of said poppet valve 3 and valve seat 1a is improved.
[0037] That is, in drawing 1 - drawing 2 , said poppet valve 3 is formed in the cone configuration where 3d side of the tip reduced sheet section 3a at the tip of lower 3b, like the example of a comparison of drawing 3 - drawing 4 . On the other hand, said valve seat 1a is formed in the cone-like side where the sheet surface 1b met the configuration of sheet section 3a at the tip of said poppet valve 3. And between the outlet side of sheet surface 1b of said valve seat 1a, and the down-stream nozzle 4, choke section 14b from which path area was extracted is formed. This choke section 14b is constituted so that it may become smaller than the path area between said sheet section 3a at the time of the maximum lift of said poppet valve 3, and said sheet surface 1b about the path area.
[0038] Moreover, tip sheet section 3a of said poppet valve 3 is [0039] which the location at 3d of the tip consists of so that it may be located more nearly up than said choke section 14b when this poppet valve 3 carries out a lift. The combustion gas generated in the combustion chamber (un-illustrating) at the time of actuation of the floating type poppet valve equipment which consists of this configuration is introduced into the inlet-port room 5 from a feed hopper 9. As shown in drawing 1 , on the other hand at the time of close [of a poppet valve 3], with a pilot valve control unit (un-illustrating) A pilot valve 6 is closed and the pressure of the working fluid in the pressure room 8 serves as high pressure. The downward force by the pressure of this working fluid becomes larger than the upward force by the combustion gas pressure in the inlet-port room 5, and sheet section 3a of a poppet valve 3 is forced on sheet surface 1b of valve seat 1a of housing 1, and is intercepting the outflow for the nozzle 4 of

combustion gas.
[0040] If said pilot valve 6 is opened as shown in drawing 2 , the working fluid in the pressure room 8 is discharged, the upward force by the combustion gas in the inlet-port room 5 becomes larger than the downward force by said working fluid, it will upper-**, said sheet section 3a will separate from sheet surface 1b of valve seat 1a, and a poppet valve 3 will open a poppet valve 3. By valve opening of this poppet valve 3, as shown in the arrow head of drawing 2 , combustion gas flows through the passage between sheet section 3a at the tip of a poppet valve, and sheet surface 1b of a valve seat, and said choke section 14b, down-stream gas passageway 4, i.e., nozzle, blows off from the inlet-port room 5 outside, and, thereby, generates a thrust.
[0041] On the other hand, a part of combustion gas in the inlet-port room 5 goes into a through-hole 11, and after it is extracted by the poppet orifice 10 and flows into the pressure room 8 side, it is discharged outside through a pilot valve 6. By changing whenever [drawing / of this poppet orifice 10], i.e., path area, the valve-opening rate and clausilium rate of a poppet valve 3 are adjusted.
[0042] Since sheet surface 1b of valve seat 1a is formed in the cone-like side met at the configuration of sheet section 3a of a poppet valve 3 in this operation gestalt at the time of valve opening of a poppet valve 3, While the flow passage area of the passage section between sheet surface 1b of sheet section 3a of said poppet valve 3 and valve seat 1a is kept constant The path area of choke section 14b formed between conic sheet surface 1b of said valve seat 1a, and the down-stream nozzle 4 Since it forms smaller than the path area between sheet surface 1b of sheet section 3a of this poppet valve 3 at the time of the maximum lift of said poppet valve 3, and said valve seat 1a, the flow of a working fluid By being extracted in this choke section 14b more slightly than said passage section, it becomes acoustic velocity 1, i.e., Mach, and the flow of said sheet section side passage section is maintained at a high speed in subsonic.
[0043] It is prevented that low voltage with a low voltage field [/ near the point of said poppet valve 3] equivalent to the conventional thing is held according to this operation, and an impulse wave occurs like said conventional technique and example of a comparison as mentioned above since the flow of the sheet section side passage section is subsonic.
[0044] Furthermore, it is prevented that turbulence of the flow of a working fluid generates the location which is 3d of tips when this poppet valve 3 of tip sheet section 3a of said poppet valve 3 carries out a lift by 3d of points of this poppet valve 3 since it is constituted so that it may be located more nearly up than said choke section 14b, down-stream gas passageway 4, i.e., nozzle.
[0045]
[Effect of the Invention] According to this invention, the sheet surface of a valve seat is formed in the cone-like side in alignment with the configuration of the tip sheet section of a poppet valve like a publication above. Since the path area of the choke section is formed smaller than the path area between the tip sheet section of said poppet valve at the time of the maximum lift of said poppet valve, and the sheet surface of said valve seat, Since low voltage with a low voltage field [/ near the point of a poppet valve] equivalent to the conventional thing is held and the flow of the sheet section side passage section serves as subsonic, it can prevent that an impulse wave occurs in a gas passageway.
[0046] Therefore, according to this invention, securing a low voltage field near the poppet valve point, generating of a harmful impulse wave is prevented in a down-stream gas passageway, and poppet valve equipment with it is obtained. [a large thrust coefficient and] [efficient]
[0047] Furthermore, in addition to said configuration, it is prevented by the point of this poppet valve like claim 2 by constituting a tip location when this poppet valve of the tip sheet section of said poppet valve carries out a lift so that it may be located more nearly up than said choke section that turbulence of the flow of a working fluid occurs in a down-stream gas passageway.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the sectional view showing the configuration of the floating type poppet valve equipment for rocket engines concerning the operation gestalt of this invention, and is drawing showing the time of poppet clausilium.
[Drawing 2] It is drawing showing the time of poppet valve opening in said operation gestalt.
[Drawing 3] It is the Fig. corresponding to drawing 1 showing the example of a comparison.
[Drawing 4] It is a Fig. corresponding to drawing 2 in said example of a comparison.
[Drawing 5] It is the Fig. corresponding to drawing 1 showing the valve-closing time of the floating type poppet valve equipment concerning the conventional technique.
[Drawing 6] It is the Fig. corresponding to drawing 2 showing the time of the valve-opening in the conventional technique.
[Description of Notations]
1 Housing
1a Valve seat
1b Sheet surface
2 Cylinder
3 Poppet Valve
3a Sheet section
3b Lower part
3d Tip
4 Nozzle
5 Inlet-Port Room
6 Pilot Valve
7 Working-Fluid Feed Hopper
8 Pressure Room
9 Feed Hopper
10 Poppet Orifice
11 Through-hole
12 O Ring
13 Piston Ring
14b Choke section

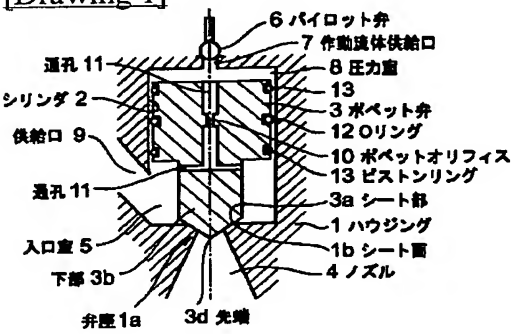
[Translation done.]

* NOTICES *

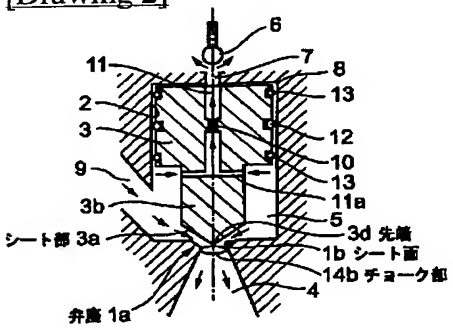
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

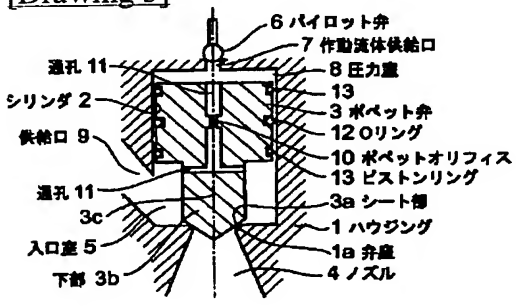
[Drawing 1]



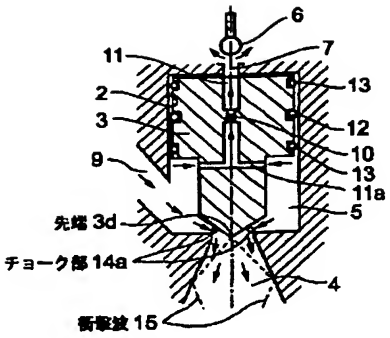
[Drawing 2]



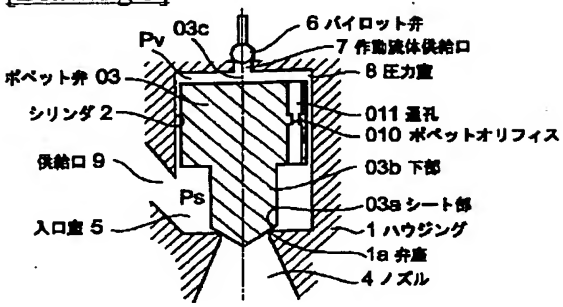
[Drawing 3]



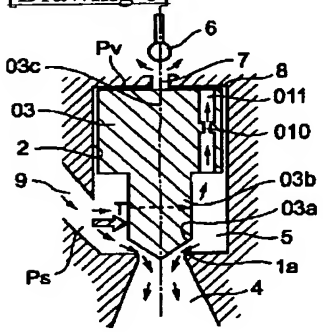
[Drawing 4]



[Drawing 5]



[Drawing 6]



[Translation done.]